

SANKIN, N.F., inzh.

Utilizing screened crushed anthracite as a filtering medium
in two-layer filters. Trudy GISI no. 40:18-35 '61.

Two-stage hydro-classifier of filtering materials. Ibid.:72-75
(MIRA 17:7)

15.6600

31566

S/081/61/000/022/062/076

B101/B147

11.9700

AUTHORS:

Sanin, N. I., Shepeleva, Ye. S., Ul'yanova, A. V.,
Kleymentov, B. V.

TITLE:

Synthesis and properties of antiwear additives to lubricants

PERIODICAL:

Referativnyy zhurnal. Khimiya, no. 22, 1961, 397, abstract
22M122 (Tr. In-ta nefti. AN SSSR, v. 4, 1960, 98 - 117)

TEXT: A four-ball friction machine was used for studying the effect of various antiwear additives consisting of high-molecular aliphatic esters and organic compounds of S, P, and Cl. The authors employed solutions of the additives (6 mmoles per 100 g) in highly pure mineral oil (viscosity 20.8 centistokes at 50°C). Of no use under heavy load were additives the effect of which was based on adsorption only (high-molecular esters and higher fatty acids). Additives containing Cl (methyl esters of mono- and dichloro stearic acid, tetrachloro naphthalene, fractions of chlorinated paraffin) increased the critical load (CL) (the seizing load), and considerably reduced the wear under loads higher than CL. Additives of the types (RS)₃P and (RO)₃PS were found to reduce CL with increasing length

Card 1/2

SANIN P.

"Obesserivaniye benzinov volzhskikh slantsev," p. 28

Goryuchiye Slantsy, No. 1, 1932.

SANIN P. MAKOVER S., NAMETKIN S. AND TSYBA A.

Kataliticheskoye Obesserivaniye Keshpirskogo Benzina V Atmosfere
Vodoroda, Goryuchiye Slantsy, 1932, No 1,32

SC:

Goryuchiye Slantsy # 1934-35, TN .871
G .74

SANIN, P., TSYBA, A., NAMEYKIN, S., AND MAKOVER, S.

Kataliticheskoye Obesserivaniye Kashpirskogo Benzina V Atmosfere Vodoroda,
Goryuchiye Slantsy, 1933, No. 1, 32.

SO: Goryuchiye Slantsy #1934-35, TN .871
G .74

CO

22

Deculfurizing shale oil gasolines by hydrogenation in the presence of sulfur catalysts. S. S. Nametkin, P. I. Sarin, S. V. Makover and A. N. Truiba. *J. Applied Chem.* (U. S. S. R.) 6, 494-507(1933).—The raw product, a gasoline from Kashpirskii shale, had a sp. gr. of 0.8008 and a S content of 0.36%. It yielded on distn. 4.7% boiling below 120°, 43.6% at 150-175°, 34.8% at 175-200° and 10.3% at 200-240°. The 150-175° fraction contained 10.6% S and was used in the expts. The hydrogenation was carried out in an autoclave with a stirrer at 350° and in the presence of 10% catalysts composed of (a) MoS₃; (b) CoS and (c) mixed catalyst composed of CoS and Al₂O₃. The S was completely removed when using MoS₃ with a yield of about 85% of a colorless and stable gasoline of 0.750-0.790 sp. gr. when hydrogenating at 350° under a pressure of 80-122 atm. and treating the product 3 times in succession. The other catalysts were not so efficient. Hydrogenation under atm. pressure was unsatisfactory.

A. A. Bochtlingk

PROCESSES AND PROPERTIES INDEX																									
<div style="display: flex; justify-content: space-between;"> ca 22 </div> <p>Desulfurizing shale gasoline by hydrogenation under pressure and in the presence of catalysts. S. S. Nametkin, P. I. Shainin, S. V. Makover, and A. N. Tsiba. <i>Goryuchnye Shkisty</i>, No. 1, 44-50 (1934).—A complete desulfurization of the shale gasoline was obtained by hydrogenation in the presence of 10% of MoS₂, for 1 hr., at 550°, at an initial H₂ pressure of 80 atm., and a process pressure of 90-90 atm., charging 7% of H₂ and consuming 3%. An increase in the temp. and pressure is not required, because in both cases a complete hydrogenation is obtained. The expts. are described and data are tabulated.</p> <p style="text-align: right;">A. A. Boettinger</p>																									
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<p>Decolorization of shale gasolines by means of catalytic hydrogenation at atmospheric pressure. S. S. Nametkin, P. I. Sutin and A. N. Tsula. <i>Goryuchie Slozheni</i> 6, No. 2, 60-2 (1934); cf. <i>C. A.</i> 28, 3571. The following catalysts were used: Mo oxides, reduced Co, W oxides, V oxides, Al_2O_3, Cr_2O_3, metallic Cr, reduced Fe, reduced Fe ore No. 3, Cr_2O_3 + oxides of Mo, Cr_2O_3 + Co, Cr_2O_3 + Al_2O_3, Cr_2O_3 + 2Fe, Cr_2O_3 + Fe, Cr_2O_3 + 4Fe and Cr_2O_3 + CaS. All the experiments were conducted at 400°. Conclusion: The hydrogenation at atm. pressure and in the presence of metals and metal oxides yields better results than that carried out in the presence of metal sulfides. The best results were obtained in the presence of Cr_2O_3 and reduced Fe ore, the activity of the former being raised by the addn. of the latter.</p> <p style="text-align: right;">A. A. Bochtlingk</p>																																																																																																																																																																								
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<p>2A</p> <p>Processes and Properties Index</p> <p>22</p> <p>Decarbonylation of shale gasolines by hydrogenation in the presence of catalysts. S. S. Nemetkin, P. I. Savin, S. V. Makover and A. N. Tsiba. <i>Khim. Tverdog.</i> <i>Topolov</i> 5, 333-37(1984); cf. C. A. 28, 6557v. A. A. Boettling</p> <p>ASAC-5LA METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			
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<p>The Chelkar caustobolite. Natural humic acids. P. L. Saulin, <i>J. Applied Chem.</i> (U. S. S. R.) 13, 244-54 (in French, 254) (1940). Three samples of caustobolite con- tained ash 30.55-30.96 and org. substances 69.45-64.04%. The org. substances contained C 63.18-63.70, H 4.98- 5.22 and (O + N + S) 31.84-30.90%. The samples contained bitumen (total) 2.3-4.5, humic acids 88.2- 89.1 and other org. substances and losses 0.5-0.4%. A. A. Podgorny</p>																			
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<div style="display: flex; justify-content: space-between;"> BC B-1-2 </div> <div style="text-align: center; margin-top: 100px;"> <p>Acids of natural bitumens. P. I. Smith (Bull. Acad. Sci. U.S.S.R., Div. Chem. Sci., 1954, No. 1, 1-10). - Kuduk bitumen con- tains $C_{80}H_{100}O + H_{14}O_{10}$. The org. acids present 1% of the bitumen and composed by means of aliphatic into 9 fractions, of which the average composition and mol. wt. correspond with $C_{10}H_{12}O_2$, $C_{12}H_{14}O_2$, and $C_{14}H_{16}O_2$; the third fraction contains 2-3 phenols and 1-2 COOH molecules per mol. Kuduk bitumen has $C_{80}H_{100}O + H_{14}O_{10} + 2COOH$. 50% of its org. acids (0-10% of the bitumen) are not in eq. COOH, and do not melt; they are similar to benzoic acids but contain an unusually small no. of phenolic groups. J. J. D.</p> </div> <div style="margin-top: 50px;"> <p>Inst. of Mineral Fuels, A.S. USSR</p> <p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p> </div>																			
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<p>3008. INVESTIGATION OF PUTILOV ASPHALT. Sanin, P.I. and Putaillo, V G (Bull acad sci U.R.S.S., Cl sci tech 1974, 734-739; J inst petrol 1945, 31, 215A). Asphalt obtained from Putilov (Leningrad area) had the following analysis (% on the organic portion): C 86.3, H 9.1, N 1.7, S 0.90 (by difference) 2.0. Ash content of a sample from from visible impurities was 1.8%. Material soluble in successive extraction with solvents was: petroleum ether 7.0, benzol 14.0, CHCl₃ 6.8%, leaving 72.2% insoluble. Analyses are given of various extracted portions and the residue. Genesis of the asphalt is discussed, particularly with reference to its possible migration and to relationship between chemical analysis and geological findings. Previous work of this nature is reviewed.</p>																			
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																			
<p>117 AND 118 ORDER</p>										<p>119 AND 120 ORDER</p>									

CA

Mechanical properties of synthetic greases at low temperatures. E. I. Sanin, *Doklady Akad. Nauk S.S.S.R.* 61, 1045-8 (1948).—On the basis of viscosity (η) data on 15 hydrocarbons of different structures, including satd. aliphatic (normal and branched), benzene derivs. with satd. and cycloparaffin substituents, compds. of the type of tetrahydronaphthalene and indane, with shearing stresses of 10-500 dynes/sq. cm. and rates of shear of 100-10,000 sec.⁻¹ (occasionally with several thousand dynes/sq. cm. and correspondingly low rates of shear of 0.1-4.0 sec.⁻¹), it could be concluded that individual hydrocarbons behave as normal Newtonian liquids, showing no viscosity anomaly, down to temps. 1-2° above the freezing temp., in some cases down to 0.2-0.5° above that temp. Hydrocarbons which do not crystallize remain normally Newtonian down to the temp. of "viscous freezing," i.e. down to the temp. at which η attains several thousand poises. Two of the hydrocarbons investigated, of mol. wt. 160 and 200, remained normal even when undercooled below their freezing temp. Mixts. of hydrocarbons of the same structure and not too different mol. wts. are also normal. Thus, a petroleum paraffin m. 63.0° re-

maintained normal between 150 and 84° and had, at 84°, $\eta = 0.0672 \pm 0.0002$ poise, independent of the shearing stress between 225 and 2060 dynes/sq. cm., and of the rate of shear between 13 and 152 sec.⁻¹. Three samples of synthetic lubricating oils, (I) mixt. of polyisobutenes of mean mol. wt. 384, $\eta = 41.4$ centipoises, (II) mixt. of hydrogenated polyisobutenes (from I), $\eta = 40.6$, and (III) synthetic oil of mean mol. wt. 300, $\eta = 7.78$, having the "viscous freezing temps." -17°, -18°, and -64°, resp., showed no anomaly of η down to the lowest temps. at which η could be measured, i.e. down to about 20,000 poises. None of the samples had a limiting shearing stress; thus, II, at -10°, η over 20,000, was a normal Newtonian liquid under as little as 0.002 g./sq. cm. Anomalies can be present in mixts. of compds. of different structures, e.g. mixts. of isomers or in mixts. of compds. of widely different mol. wts.

N. Thon

Inst-Petroleum, AS USSR

ASD-36A METALLURGICAL LITERATURE CLASSIFICATION

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CA

8

Bitumens and bituminous minerals of Cambrian deposits.
P. I. Sanin, V. G. Putailo, and S. P. Uspenski. *Trudy*
Inst. Nefi, Akad. Nauk S.S.S.R. 1, No. 2, 71-94 (1950).—
The presented material is an analysis of the chem. results
assembled in an investigation of bitumens in the Yakut
A.S.S.R. Twenty-four tables of chem. analyses are given.
M. Houch

1952

SANIN, P. I.

Chem
Chemical Abst.
Vol. 48 No. 4
Feb. 25, 1954
Petroleum, Lubricants, and Asphalt

4 (2)
The surface activity of additive depressors. P. I. Sanin, *Trudy Vses. Nauch. Akad. Nauk. S.S.S.R.* 1, No. 2, 200-10 (1950).—To get evidence for the adsorption mechanism of the action of depressors in lowering the pour point of lubricating greases S. measured the surface tension isotherms of the depressors, "parafflow" (a mixt. chiefly of dialkyl naphthalenes mol. wt. 710) (I), "santopour" (II), ceresin phenol (mol. wt. 999) (III), "paraffin-benzylphenyl ether" (mol. wt. 850) (IV), "oxidized petrolatum" (mol. wt. 819) (V), and Al stearate (mol. wt. 3500) (VI). The mol. wts. were detd. cryoscopically in benzene. All the depressors are mixts. of substances. The surface tension measurements were all made at 30° at a water interface with the depressor dissolved in an org. solvent. All the depressors had about the same surface tension coeff. of 25 ergs/sq. cm. The solvents used and their surface tension coeffs. in ergs/sq. cm. were: very pure paraffin oil, 51.9, $d_{15}^{20} = 0.8053$, benzene (cryoscopic grade) 34.9, and "normal benzine" 49.3. The "normal benzine" was light ligroline freed of resins, unsatd. and aromatic compds. by treatment with fuming H_2SO_4 and alkali. Its boiling range was 65-95° and $d_{15}^{20} = 0.7050$. The limiting lowering of the surface tension of both "normal benzine" and paraffin oil by the depressors was reached at a concn. of 0.01 mole/l. The surface tension of each solvent was lowered from an initial value of about 50 ergs/sq. cm. to values of about 40 by II or IV, about 30 by I, about 25 by III, and about 15 by V. The surface tension coeffs. of benzene were lowered from 38 to 28 ergs/sq. cm. by VI while that of paraffin oil was lowered from 35 to 33 ergs/sq. cm. by VI. I was sepd. into 4 fractions by successive extn. twice with "normal benzine," once with benzene and once with alc. The pour point of paraffin oil was lowered from -10° to -24° by the first fraction (79.9% of the original material), from -10° to -46° by the second fraction (8.77% of the original material), and from -10° to -56° by the third fraction (9.74% of the original material). The fourth fraction was only 1.54% of the original and no pour point figures were given for it.
Joseph B. Levy

SANIN, P. I.

Chemical Abst.
Vol. 48 No. 6
Mar. 25, 1954
Petroleum, Lubricants, and Asphalt

Determination of static limiting shear stress of lubricating
oils. P. I. Sanin. *Trudy Inst. Nefti, Akad. Nauk S.S.S.R.*
S.R. I. No. 2, 214-16 (1950). — A modified Hooke's capil-
lary method for the detn. of shear stress was used in detg.
the limit values at low temps. All petroleum lubricants
possess limiting static shear stress. The same method was
used in the study of the depressor effects on the shear stress.
W. M. Sternberg

②

400

6-4-54
SJS

CA

22

Determination of the maximum shear stress of petroleum products by the method of capillaries (capillary microviscometer). P. I. Saikin, Zhurnal Khim. 10, 819-22 (1950).—The capillaries were shaped to conform to the vertical cross-section of a suction flask. The diam. of the horizontal section, which was filled with the oil, was calibrated with Hg with an accuracy of 0.01 mm. The straight arm of the capillary was connected to a source of pressure, water, and Hg manometers, and the side arm was connected to a vacuum and a Hg manometer. The capillary with oil was kept in a thermostat (water bath) at 50° for 10 min., then at room temp. for 15 min., and finally in thermocryostat for a definite period (to permit structure formation in the oil) at the given temp. The pressure in the system was increased at a definite rate. Shear stress θ , was detd. from $\theta = P_0 d / 4l$, where P_0 is crit. pressure, d is diam. of capillary in cm., and l is length of oil column in cm. Most suitable d was approx. 2 mm. and l to approx. 30 mm. Shear detns. possible with this app. range from 0.1 to 100 g./sq. cm.

B. Z. Kamich

Inst. of Petroleum, AS USSR

CA

Plasticity of lubricants at low temperatures. P. I. Sanin.
Kolloid. Zhur. 13, 117-22 (1951).—Lubricant pellets 3 cm.
 long in a capillary 0.202 cm. in diam. were pushed by a
 pressure difference P g. wt./sq. cm. (*Low-Temp. Properties*
of Petroleum Products (a symposium) 1949, p. 35). Hy-
 drogenated polyisobutylene moved with a speed propor-
 tional to P , and its viscosity at -40° was approx. 2×10^4
 poises. An oil from Surukhan petroleum did not move at
 P less than P_{min} and moved at once at P more than P_{max} ;
 at P between P_{min} and P_{max} the oil started to move earlier,
 the greater the P . The range P_{min} to P_{max} was 0.2-
 0.35 at -10° , 0.7-2.0 at -20° , 4.5-6.5 at -30° , and 5-20
 at -35° . The rate of displacement of this oil was almost
 independent of P (as long as P is more than P_{min}) and
 simulated a η of 10^7 , 10^8 , and 10^9 poises at -10° , -20° , and
 -40° , resp. J. J. Bikerman

SANIN, P. I,

USSR/Chemistry - Liquid Fuels

Jul 52

"Properties of Diesel Fuels at Low Temperatures,"
P. I. Sanin, N. V. Melent'yeva

"Trudy Inst Nefti" Vol 2, pp 39-46

PA 24379
Established that in 3 moisture-free samples of diesel fuel (Sakhan winter grade (I), Surakhan summer grade (II), Tuzmazy summer grade (III)) the temps of clouding are determined by the crystallization of hydrocarbons. Structure formation in diesel oils at low temps is analogous to that in lubricating oils. Congelation point depressants (Parafflow Alkylphenol 10, Alkylphenol 11, etc.) retard the transition of the

24379

diesel oils into the colloidal state. I is the oil least susceptible to the action of depressants, III the most susceptible. While the temp of congelation of III could be lowered to the standard value by the addition of depressants, the clouding point could not. New depressants will be tested and the filterability of fuels at low temps investigated.

24379

SANIN, P. I.

Chemical Abst.
Vol. 48 No. 3
Apr. 25, 1954
Petroleum, Lubricants, and Asphalt

③
A method of determining the threshold shear stress of mineral oils. P. I. Sanin and E. A. Nikitskaya. *Trudy Inst. Nefti, Akad. Nauk S.S.S.R.* 2, 47-52 (1952).—Static shear stress, θ , computed from $\theta = Pd/4l$ (where P is the crit. pressure at which motion of oil occurs, d = diam. of capillary in cm., l = length of column of oil in cm.) is independent, within broad limits, of rate of application of load, diam. of capillary, and length of oil column if the pressure accurately corresponding to the beginning of motion is taken as the crit. pressure. V. N. Bednarski.

7/11A
10-14-54
JSP

SAMIN, P. I.

Lubricants

Dissertation: "Structural and Mechanical Properties of Lubricating Oils and the Effect of Surface-Active Substances on Them." Dr Chem Sci, Inst of Petroleum, Acad Sci USSR, Oct-Dec 1953. (Brief Summary Given.)
(Vestnik Akademii Nauk, Moscow, March 1954)

SO: SUM 213, 20 Sept 1954

TOPCHYEV, A.V., akademik; SERGIYENKO, S.R.; SANIN, P.I.

S.S.Nametkin, an outstanding Soviet scientist. Trudy po ist.tekh.
no.3:3-29 '53. (MIRA 7:5)

(Nametkin, Sergei Semenovich, 1876-1950) (Petroleum
products--Analysis)

SANIN, P. I.; PUTSILLO, V. G.

Admixtures lowering the solidification point of greases. Trudy
Inst. nefti no. 6:116-127 '55. (MIRA 8:12)
(Lubrication and lubricants--Cold weather conditions)

Translator 550424

SANTIN, P. I.

"Use of Organophosphorous Compounds to Improve Lubricating
Oils"
paper presented at Nn First Conference on Phosphorous Compounds, Kazan,
8-10 Dec 56

SO: B-3,084,841

SAVIN, P. L.
The mechanism of additive action by the use of labeled
Organic thiophosphites. G. V. Vinogradov, M. M. Kusi-

measured at 20, 40, 60, 80, and 150°. After at 20° and
the rate of reaction of P³² with steel at 20° was
value of 0.76 μ /sq. cm. It was found also to be the ac-
ceptor of P³² and S³² though much more reactive.
A. P. Kotloby

SANIN, P.I., doktor khimicheskikh nauk.

~~Sergei Semenovich Nametkin~~; on the 80th anniversary of his birth.
Khim.nauka i prom. 1 no.6:713-715 '56. (MLRA 10:3)
(Nametkin, Sergei Semenovich, 1876-1950)

SANIN, P.I.; UL'YANOVA, A.V.; SHER, V.V.

Chemical structure of surface-active substances (depressing agents) which increase the fluidity of lubricating oils at low temperatures. Khim. i tekhn. topl. no. 8:54-58 Ag '56. (MLRA 9:10)

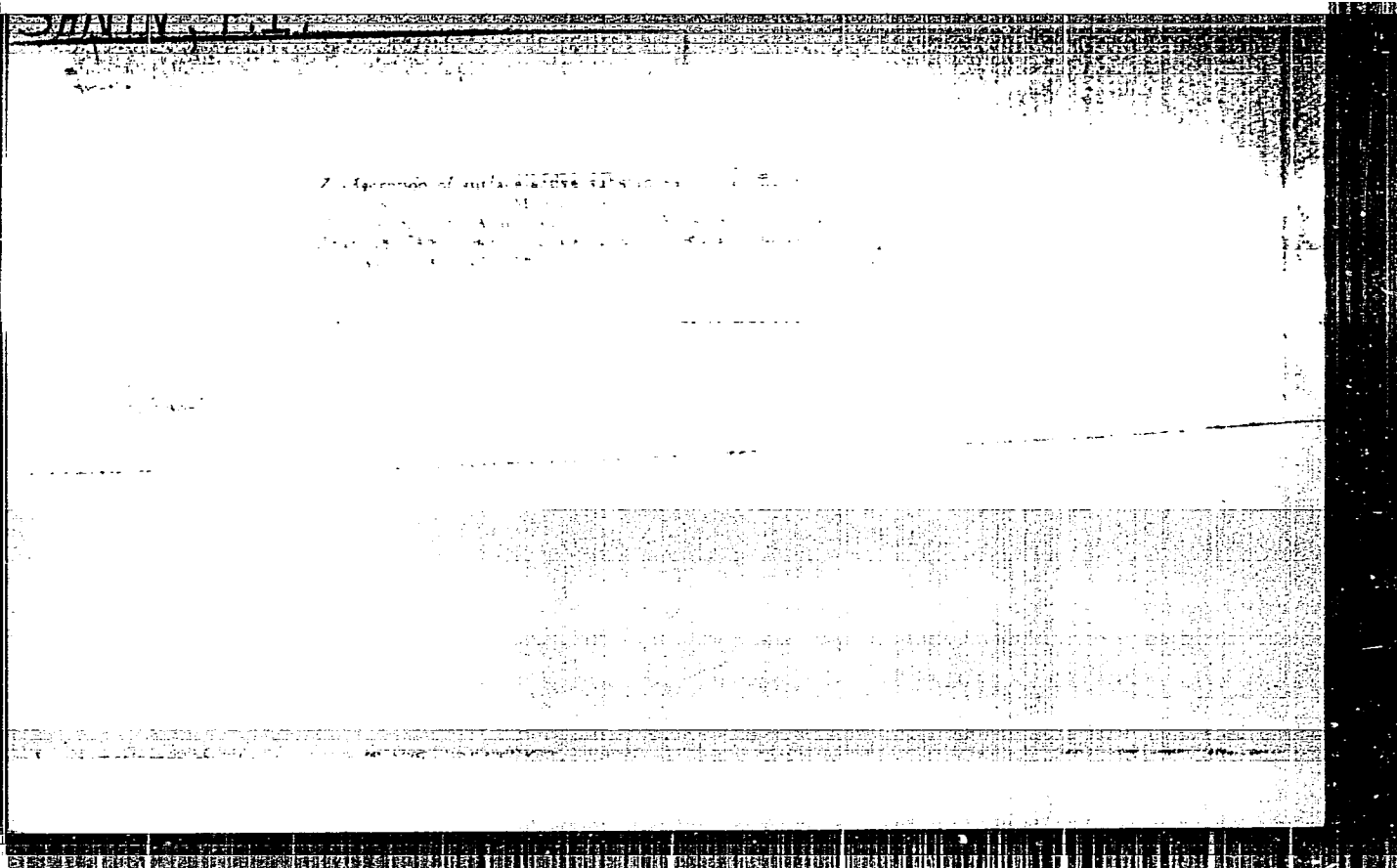
1. Institut nefti Akademii nauk SSSR.
(Lubrication and lubricants) (Surface--Active agents)

SANIN, P. I.

344
Chemical structure of alkyl phenols and their activity as pour-point depressants. P. I. Sanin and V. V. Sher. *Trudy Inst. Nefti, Akad. Nauk S.S.S.R.* 8, 180-181 (1960); *cf. C.A.* 50, 11656f. Since alkyl phenols condensed with chlorinated phenols in the presence of $AlCl_3$ are very active pour-point depressants and their structure is not known eighteen pure alkyl phenols were synthesized. The alkyl chain structure was found to be important for the depressant effect, and the normal structure was found to be preferable to a branched structure. An *n*-octadecyl phenol was more active than the corresponding para isomer. For the p.p. of these compounds is high and their sol. in oil low for being useful. Their sol. was improved by the addition of branched alkyl groups (obtained by condensation with chlorinated polyisobutene). *n*-Octadecyl phenols containing tertiary C atoms in the chain directly linked to the phenol ring, with a long C chain forming the rest of the alkyl, were good depressants. Increasing the no. of alkyl chains improved the depressant effect. A table of 18 alkyl phenols is given listing m.p. or b.p. and depressant efficiency. W. M. Sternberg

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4E3d-1 } 2
4E4f-1 }

PM JEB



Saunin, P. I.

Syntheses of some organophosphorus compounds and a
study of their effect on properties of mineral oils. P. I.
Saunin and V. V. Sher. Proc. Acad. Sci. U.S.S.R., Sect.
Chem. 107, 181-3 (1956) (Engl. translation).—See C.A. 50,
14314b. B. M. R.

2

SANIN P. I.

USSR/Organic Chemistry - Synthetic Organic Chemistry, E-2

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 959

Author: Sanin, P. I., and Sher, V. V.

Institution: Academy of Sciences USSR

Title: Synthesis of Some Organophosphorus Compounds and Investigation of Their Effect on the Properties of Mineral Oils

Original

Periodical: Dokl. AN SSSR, 1956, Vol 107, No 4, 551-553

Abstract: The Ba- and Ni-salts of $(RO)_2PSSH$ acids (I), disulfides of the type $[(RO)_2PSS]_2$ (II), and $[(C_{18}H_{27}O)_2POO]_2Ba$ (III) have been synthesized and their effect on the properties of mineral oils has been investigated. The following I have been prepared (R, bp in °C/mm, n_D^{20} and d_4^{20} are indicated in that order): n-C₄H₉, 121.0-122/2.5, 1.4940, 1.0689; iso-C₅H₁₁, 147.0-148.0/2.5, 1.4887, 1.0354. For I (R = n-C₈H₁₇), mp 79.5-80.5°. The substance, R, mp in °C, the effect on film formation on the piston of a PZV [compressed air?] engine in scale divisions, and on the corrosion of a Pb-strip in gms/m² are

Card 1/2

3
✓ Synthesis and properties of ethers of polysulfate phenols.
I. S. Sidorov and L. I. Illarionova. Dokl. Akad. Nauk
Sov. Union, 198, 253 (1966) English translation
in: J. Polym. Sci., 50, 116 (1966). H. M. R.

SANIN, P.I.; UL'YANOVA, A.V.

Synthesis and properties of polyatomic phenol ethers. Dokl. AN SSSR
108 no.2:274-276 My '56. (MIRA 9:9)

1. Institut nefti Akademii nauk SSSR. Predstavleno akademikom A.V.
Topchiyevym.
(Ethers)

SANTIN, F. L.
Synthesis and properties of some esters of chloromethyl and
chloroalkyldithiophosphonic acids / E. S. Shepeleva and P.
I. Sabin. *Proc. Acad. Sci. U.S.S.R., Ser. Chem.* 109, 487-8
(1960) (English translation).—See *C.A.* 51, 4934i.
B. M. R.

4
4E4
4E4C4
2max
4E3R

SANIN P.I.

Synthesis and properties of some esters of chloroalkyl and chloroalkyldithiophosphonic acids E. S. Shengelaya and P. I. Saitin, *Doklady Akad. Nauk*, 1969, 199, 515

The chloroalkyl dithiophosphonic acids were synthesized from the corresponding chloroalkyl phosphonic acids and CS_2 . The chloroalkyl phosphonic acids were synthesized from the corresponding alcohols and PCl_5 . The chloroalkyl phosphonic acids were washed with H_2O and dried, yielding 60% $\text{ClCH}_2\text{PO}(\text{SCH}_3)_2$, b. 153-4°, d. 1.411, n_D^{20} 1.4900. Similarly were prepd. the following esters of mercaptans, while the *o*-alkyl esters were prepd. from RPOCl_2

and the alc. (d. and n_D^{20} given): 74% $\text{ClCH}_2\text{PO}(\text{OCHMe})_2$, b. 73-4°, d. 1.1175, 1.4340; 64% $\text{ClCH}_2\text{PO}(\text{OBu})_2$, b. 112-13°, d. 1.0802, 1.4420; $\text{ClCH}_2\text{PO}(\text{OCH}_2\text{CH}_2\text{CHMe})_2$, 79%, b. 129-30°, d. 1.0480, 1.4140; 60% $\text{ClCH}_2\text{PO}(\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_3)_2$, b. 12-13°, d. 1.1805, 1.4700; 47% $\text{ClCH}_2\text{PO}(\text{SCH}_2\text{CH}_2\text{CH}_3)_2$, b. 157-8°, d. 1.0900, 1.4220; 51% $\text{ClCH}_2\text{CH}(\text{CH}_3)\text{PO}(\text{OCH}_2\text{CH}_2\text{CH}_3)_2$, b. 53-54°, d. 1.0640, 1.4430; 54% $\text{ClCH}_2\text{CH}(\text{CH}_3)\text{PO}(\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_3)_2$, b. 106-107°, d. 1.0444, 1.4430; 43% $\text{ClCH}_2\text{CH}(\text{CH}_3)\text{PO}(\text{OCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3)_2$, b. 68-70°, d. 1.0518, 1.4430.

(M⁺)⁺

Inst. Petroleum, A.S. USSR

SANIN, P. I.; SHEPELEVA, Ye. S.; SHER, V. V.; UL'YANOVA, A. V. (Institute of Petroleum, AS USSR, Moscow)

"Use of Organophosphorus Compounds for Increasing the Quality of Lubricants"
(Primeneniye fosfororganicheskikh soyedineniy dlya povysheniya kachestva smazochnykh masley)

Chemistry and Uses of Organophosphorous Compounds
(Khimiya i primeneniye fosfororganicheskikh soyedneniy),
Trudy of First Conference, 8-10 December 1955, Kazan,
pp//2- Published by Kazan Affil. AS USSR, 1957
123

4E3d - 1

Structure effects of the salts of the acid esters of dithiophosphoric acid on their activity as additives to lubricants. P. I. Sapin and V. V. Sher, *Russ. J. Technol. Appl. Chem.* 1951, No. 3, 38-48. The following dithiophosphates were given (m.p. given): Ba di-Bu, 138-8°; Ba di-iso-am, 170-80°; Ba di-n-decyl, 67-8°; Ba di-n-octadecyl, 99-100°; Ba di(2-heptylundecyl), about 165°; Ni di-Bu, 16.0-16.5°; Ni iso-Am Am, 23.5-24.5°; Ni di-n-decyl (I), 20-21°; Ni di-n-octadecyl (II), 60.5-61.5°; K di-n-octadecyl dithiophosphate, m. 100-7°. The disulfides $[(C_8H_{17}O)_2P(S)_2]_2$ and $[(C_{18}H_{37}O)_2P(S)_2]_2$, were prepd. Ba di-n-octadecyl phosphate, m. about 200°. The soly. of the salts in iso-octane and cyclohexane increased with the temp. rise and became complete near the m.p., so that the Ni salts, with their low m.p., were very sol. in the cold, while the Ba and K salts were very little sol. (less than 0.2 millimole/100 g. solvent). The effect of the compds. on the detergent qualities of the oils increased with the length of the alkyl chains. II had the highest detergent quality, and I occupied an intermediate position. Branching of the alkyl chains did not greatly affect the detergent quality. Most of the compds. were good corrosion inhibitors, which was attributed to the S in the mol. The alkyl dithiophosphates increased the thermal oxidizability of the lubricants and delayed the lacquer formation at high temps. W. M. Sternberg

RM *[Signature]* AMB

SANIN, P.I.

I-8

USSR/Chemical Technology - Chemical Products and Their
Application. Treatment of Natural Gases and Petroleum.
Motor and Jet Fuels. Lubricants.

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 2614

Author : Sanin, P.I., Chernyavskaya, L.F., Foyt, I.F.

Inst : -

Title : Procedure of Determining the Corrosive Properties of
Lubricating Oils.

Orig Pub : Zavodsk. laboratoriya, 1957, 23, No 6, 696-697

Abstract : The modifications which the authors have made in the method of Yu.A. Pinkevich, for determining the corrosive properties of lubricating oils, have ameliorated the temperature conditions of the test and have made it possible to carry out determinations of the corrosive properties of light oils. In the modified apparatus the metal plate is maintained at 140° throughout the duration of the test, which accelerates the corrosion process by two times. A drawing of the apparatus is included.

Card 1/1

Incl. Petroleum, AS USSR

SANIN, P. I.

VIPPER, A.B.; PAPOK, K.K.; SANIN, P.I.; SHER, V.V.

Demulsifying property of some oil additives from organophosphorus compounds. Khim i tekhn. topl. i masel 3 no.3:45-47 Mr '58.

(MIRA 11:3)

(Phosphorous compounds)
(Lubrication and lubricants)

SOV/65-58-9-5/14

AUTHORS: Sanin, P. I; Sher, V. V. and Nikitskaya, Ye. A.

TITLE: Metal Dialkyl Dithiophosphates as Complex Additives to Lubricating Oils. (Dialkilditiofosfaty metallov kak kompleksnyye prisadki k smazochnym maslam).

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr.8. pp. 24 - 28. (USSR).

ABSTRACT: In early articles it was shown that metal dialkyl dithiophosphates are active complex additives (Ref.1 - 2). Dialkyl dithiophosphates of various metals have varying effect on the deterative and corrosion properties of oils. Tests were carried out on two types of oil: the oil MS-20 (from the Emba Region) and the oil MK-22 (from the Baku Region). Properties of these oils are given. From Table 1 it can be seen that these additives show varying degree of activity. The most active additive was the barium dialkyl dithiophosphate DF-1 when added to the oil MS-20. This additive contained about 4% P; 9% S, and 8% barium, and was used in the form of a 50% solution in spindle oil AU. The action of this additive on the characteristics of various oils was investigated under laboratory conditions. Table 3: the dependence of the corrosion of oils on the concentration of DF-1. Results of this

Card 1/2

SOV/65-58-9-5/14

Metal Dialkyl Dithiophosphates as Complex Additives to Lubricating Oils.

Investigation indicates that the optimum concentration of the additive DF-1 is about 3%. Other tests concerned the effect of the additive on the oil MS-20 with regard to its stability to oxidation (GOST 4953-49), and its tendency to lacquer formation (GOST 6049-51) (Table 4). The acid number of the samples containing the additive, after testing in the device PZV, were considerably lower than for oils not containing the additive (Table 5). Practical experiments were carried out on the one-cylinder engine IT-9-3 (designed by VNII NP) under the supervision of V. F. Filippova. Results of these tests are given in Table 6. Table 7: the effect of the additive on the solidification point of the oils; Table 8: the effect of complex additives on some properties of the oil MS-20 (containing 3% of the additive). There are 8 Tables and 4 Soviet References.

ASSOCIATION: Institut nefti AN SSSR. (Petroleum Institute, AS USSR).

1. Lubricant additives--Effectiveness
2. Phosphates--Applications
3. Lubricating oils--Test results

Card 2/2

SANIN, P. I., SHER, V. V., KULIYEV, A. M.

"Synthetic Additives for Lubricating Oils. Influence of Additive
Structure of Their Activity."

Report submitted at the Fifth World Petroleum Congress, 30 May -
5 June 1959. New York.

S/081/61/000/022/059/076
B101/B147

AUTHORS: Sanin, P. I., D'yachkova, Ye. A., Komissarova, N. I.

TITLE: Separation of sulfurous compounds from aromatic hydrocarbons by adsorption chromatography

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 22, 1961, 393, abstract 22M84 (Sb. "Khimiya seraorgan. soyedineniy, soderzhashchikhsya v neft'yakh i nefteproduktakh". M., AN SSSR, 1959, 125-138)

TEXT: Comparative studies of adsorbents of the metal silicate type were carried out with a view to separating aromatic and S compounds contained in the oil fraction (325-375°C) of the Romashki petroleum. Chromium silicate was found to be the best adsorbent. Chromium silicate enabled adsorption-chromatographic separation of that part of the light monocyclic aromatics containing 0.05% sulfur (approximately 0.4% of the S compounds) from aromatics and S compounds of the above-mentioned oil fraction (3.9% sulfur). Chromium silicate is described to have a catalytic effect on S compounds of this oil fraction. [Abstracter's note: Complete translation.]

Card 1/1

SANIN, P. I.

5(3), 5(4)
 ACTIONS:
 Petrov, A. A., Sergiyenko, S. M., Tashilina, A. L.,
 Rezhitskaya, E. A., Sanin, P. I., Kizitskaya, Ye. A.
 807/62-59-8-13/42
 Synthesis and Properties of the Diallyl-substituted Alkanes
 Having the Composition $C_{12}H_{22}$
 Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk,
 1959, No. 9, pp. 1421-1424 (USSR)
 ABSTRACT:
 The present paper discusses the synthesis and properties of
 some of the compounds mentioned in the title. The properties
 of the synthesized materials are given in table 1. Nearly
 all substances crystallize at low temperatures; only 2,4-di-
 methyldecane and 3,5-dimethyldodecane vitrify at much lower
 temperatures than do their isomers or adjacent homologs.
 Besides reference 3, investigations aimed at the explanation
 of these phenomena have also been carried out by Petrov
 (Ref. 4). It was assumed that the characteristic feature of
 vitrification of these compounds mentioned is due to their
 structure. This investigation of viscosity as a function
 of temperature (Table 2) and determination of molecular
 weights (Table 3) confirm this assumption. From the results it is seen that the influence of
 the structure on the vitrification effect cannot be limited.

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3

It was only possible to establish a certain dependence on
 the branching degree of the compounds. There are 2 tables
 and 5 Soviet references.

ASSOCIATION: Institut nefti Akademii nauk SSSR
 (Petrolean Institute of the Academy of Sciences, USSR)

SUBMITTED: December 10, 1957

Card 2/2

SANIN, P.I.; MELENT'YEVA, N.V.

Effect of the structure of hydrocarbons on their viscosity. Trudy
Inst.nefti 13 '59. (MIRA 13:12)
(Hydrocarbons) (Viscosity)

SOV/80-32-5-36/52

5(3)

AUTHORS: Vinogradov, G.V., Kusakov, M.M., Sanin, P.I., Razumovskaya, E.A., Ul'-yanova, A.V.

TITLE: The Interaction of Thioorganic and Thiophosphoroorganic Additions to Oils With Metals

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol 32, Nr 5, pp 1136-1141 (USSR)

ABSTRACT: Anti-wear admixtures to oils containing sulfur-, phosphorus- and chlorine-compounds are widely applied. The functional limits of their action is investigated here by means of labeled atoms. They were dissolved in the non-polar fraction of bright stock and their interaction with chromium-manganese-silicon steel and electrolytic copper was studied. The interaction of steel with sulfur starts already at room temperature. The reaction of sulfur with copper is more intense. The reactivity of disulfide is higher than that of sulfide due to the higher mobility of the sulfur atoms in the disulfide molecule. The sulfur is bound to steel and copper irreversibly, i.e. chemically. Experiments with tributyltrithiophosphite labeled by P^{32} and S^{35} have shown that phosphorus reacts more intensively with steel than sulfur. At 20°C it is bound in the amount of 4.2 mg/cm^2 . At 140°C and higher the decomposition of tributyltri-

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SOV/80-32-5-36/52

The Interaction of Thiocorganic and Thiophosphoroorganic Additions to Oils With Metals

thiophosphite starts which may be regarded as the upper limit of the protective action. A film of iron phosphide is more easily formed on steel than a sulfide film. At a temperature increase sulfur reacts more intensively with copper than with steel. There are 5 graphs, 1 table and 6 references, 5 of which are Soviet and 1 American.

SUBMITTED: January 22, 1958

Card 2/2

PETROV, Aleksandr Aleksandrovich; SANIN, P.I., doktor khim.nauk, otv.red.;
LOSKUTOVA, I.P., red.isd-va; MARKOVICH, S.G., tekhn.red.

[Catalytic isomerization of hydrocarbons] Kataliticheskaya
izomerizatsiya uglevodorodov. Moskva, Izd-vo Akad.nauk SSSR,
1960. 213 p. (MIRA 13:11)
(Hydrocarbons) (Isomerization)

5.4100

77543
SOV/65-60-2-3/15

AUTHORS:

Sanin, P. I., Petrov, A. D., Melent'yeva, N. V.,
Meshcheryakov, A. P., Kaplan, Ye. P., Pokrovskaya,
Ye. S., Andreyev, D. N.

TITLE:

Viscosity of Hydrocarbons at Low Temperatures

PERIODICAL:

Khimiya i tekhnologiya topliv i masel, 1960, Nr 2,
pp 11-19 (USSR)

ABSTRACT:

The viscosity of 30 different hydrocarbons at various temperatures are measured. The experimental data are illustrated in Figs. 1 and 2. The examined compounds are: (1) n-decane; (2) n-hexadecane; (3) paraffin; (4) n-hexatriacontane; (5) ceresin (from oil); (6) Isooctane; (7) isododecane; (8) isohexadecane; (9) tetraamylethane; (10) triheptylmethane; (11) polyisobutene, fraction 100 to 150° C/1 mm; (12) polyisobutene, fraction 150 to 250° C/1 mm; (13) the same after hydrogenation; (14) polyethylene; (15) poethylene, fraction 190 to 260° C/5 mm;

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Viscosity of Hydrocarbons at Low Temperatures

77543

SOV/65-60-2-3/15

(16) cyclohexylbenzene; (17) cyclohexyltoluene; (18) para-di(tertiary-butyl)benzene; (19) cyclohexylindan; (20) dicyclopentyl-para-xylene (1,4-dimethyldicyclopentylbenzene); (21) dicyclohexylindan; (22) dinexylcyclohexylbutane (1-cyclohexyl-4-hexyldecane); (23) tetralin; (24) n-propyltetralin; (25) isopropyltetralin; (26) isopropyldecalin; (27) secondary-butyltetralin; (28) di(secondary-butyl)tetralin; (29) 2,2,4,4-tetramethylbutyltetralin; and (30) n-octyltetralin. The experiments confirmed the rule that for hydrocarbons of a given type, the slope of the viscosity-vs-temperature ($\eta = f(t)$) curves increases with the increasing molecular weights, and the slope is especially steep at low temperatures. Straight-chain aliphatic hydrocarbons permit the study of their viscosity-vs-temperature characteristics most clearly. Then follow branched aliphatic compounds whose viscosity-vs-temperature characteristics become less clearly pronounced with the increased number of branches. Polycyclic hydrocarbons, containing two condensed rings,

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Viscosity of Hydrocarbons at Low Temperatures

77543
SOV/65-60-2-3/15

of which one is aromatic, take third place in this respect. Polycyclic hydrocarbons containing no paraffin alkyl groups, show the least clear pictures. Generally, the longer the alkyl groups the more decisive is the effect of their structure. The crystallization temperature of straight-chain aliphatic compounds is higher than that of branched aliphatic compounds. The crystallization temperature of the latter drops with increasing number of branches. High-quality lubricants must have good viscosity-vs-temperature characteristics and preserve their fluidity at low temperatures. In other words, they must combine the properties of normal and iso-paraffins. This means that the hydrocarbons must have the degree of branching necessary to lower the crystallization point to a desired level but no more. There are 3 figures; 3 tables; and 5 references, 4 Soviet, 1 U.K. The U.K. reference is: West, H. Z., J. Inst. Petrol., 34, Nr 298, 781, 806 (1948)

Card 3/5

Viscosity of Hydrocarbons at Low Temperatures

77543
SOV/65-60-2-3/15

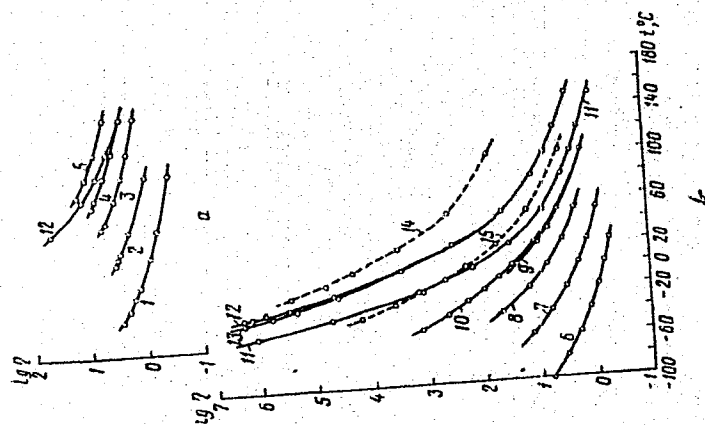
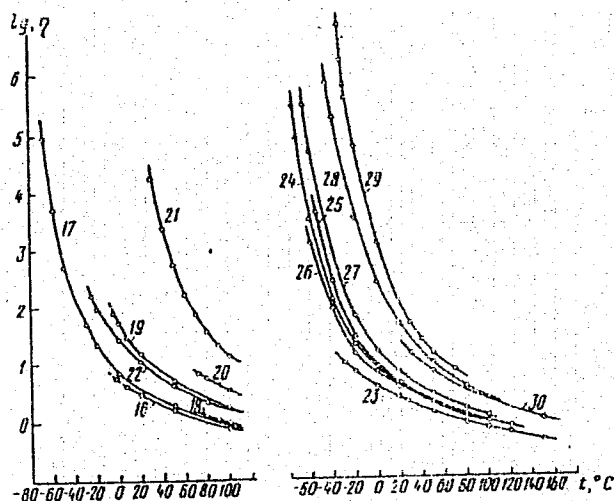


Fig. 1

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Viscosity of Hydrocarbons at Low Temperatures

17543
SOV/65-60-2-3/15



ASSOCIATION:

Institute of Petrochemical Synthesis of the Academy of Sciences of the USSR (Institut neftekhimicheskogo sinteza AN SSSR)

Card 5/5

0.0000

77944
SOV/65-60-3-17/19

AUTHOR: Sanin, P. I.

TITLE: Conference on Chemistry and Application of Organophosphorus Compounds

PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1960, Nr 3, p 71 (USSR)

ABSTRACT: At the end of November 1959, the Second Conference on Chemistry and Application of Organophosphoric Compounds was held in Kazan'. It was organized by the Chemical Institute of Kazan', an affiliate of the Academy of Sciences of USSR (Khimicheskiy institut Kazanskogo filiala AN SSSR), and by the Kazan' Institute of organic Chemistry (Kazanskiy institut organicheskoy khimii). The first conference was held in December 1955 (Papers on the first conference, published by the Academy of Sciences of USSR, Moscow, 1957 (khimiya i primeneniye fosfororganicheskikh soyedineniy. Trudi pervoy konferentsii. Izd. AN SSSR, M., 1957)). Taking an active

Card 1/2

82511

S/065/60/000/008/003/007
E030/E412

15.6600

AUTHORS: Sanin, P.I., Shepeleva, Ye.S. and Kleymenov, B.V.
TITLE: Some Data on the Activity of Additives Containing the CCl₃ Group
PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1960, No.8, pp.24-28

TEXT: It has been shown that molecules containing phosphorus and CCl₃ groups are exceptionally good friction-reducing additives under high loads. Presumably this is due to the formation of phosphides and chloride layers on the metal. It is not merely the presence of chlorine which imparts activity, since monochloro-alkanes are not particularly effective, but the CCl₃ group as a whole. This group is known to be particularly reactive, as in the action of electrophilic or copper reagents, and in the formation of 1,5,5,6,6,10-hexachlorodecane from 1,1,1,5-tetrachloropentane. The base greases had a kinematic viscosity of 20.8 cs at 50°C. The trichloro compounds were formed by the polymerization of ethylene in the presence of carbon tetrachloride and were added as 6 times millimolar to the grease. The greases were subjected to the four-ball test. Firstly, the effect of the trichloro group was shown by
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82511

S/065/60/000/008/003/007
E030/E412

Some Data on the Activity of Additives Containing the CCl_3 Group

comparing the base grease, which had a critical load of 64 kg, with $\alpha, \alpha, \alpha, \omega$ tetrachloro-alkanes which had critical loads from 100 - 110 (C_5 was as high as 130 kg). This behaviour is analogous to that of CCl_4 , which is active, and of monochloro-alkanes, which are relatively inactive. Secondly, the addition of phosphorus was shown to increase the surface activity still further, as shown by comparing the methyl, trichloro and chloro ethylethers of methylphosphonic acid (critical loads less than 170 kg), and the trichloroethyl-diethyl ether of phosphonic acid (130 kg). Increasing the additive concentration fourfold had no effect. Increasing the number of CCl_3 groups produces further striking increases in the high-load properties and in fact no critical loads could be observed with tri (trichloroethyl) phosphate and tri (trichlor-tert. butyl) phosphate, and the mark was only 8 mm in diameter at 300 kg load (30000 kg/cm^2 pressure). Smaller variations in activity and thermal stability were dependent on the position of the CCl_3 group in the molecule. There are 3 figures,

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82511

S/065/60/000/008/003/007
E030/E412

Some Data on the Activity of Additives Containing the CCl_3 Group
3 tables and 11 references: 5 Soviet and 6 English.

ASSOCIATION: Institut neftekhimicheskogo sinteza AN SSSR
(Institute for Petro-Chemical Synthesis, AS USSR)

Card 3/3

156600

11.9700

29447
S/C81/61/000/017/149/166
B117/B138

AUTHORS: Sanin, P. I., Shepeleva, Ye. S., Ul'yanova, A. V., Kleymenov, Ye. V.

TITLE: Effect of synthetic lubricating oils additives on frictional wear

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 17, 1961, 472 - 473, abstract 174224 (Tr. 3-y Vses. konferentsii po treniyu i iznosu v mashinakh. M., AN SSSR, v. 3, 1960, 234 - 239)

TEXT: The relative effect on the seizing load (SL) and on the wear of a number of Cl-, S-, and P-containing additives was studied on a 4-ball friction machine. The additives were tested in the solution of a highly refined mineral oil with a viscosity of 20.8 cst/50°C at a concentration of 6 moles of additive per 100 g of oil. Oleic and stearic acids, as well as methyl stearate, did not change the character of the wear-load curve, nor increase the SL of the pure oil (69 kg). SL were determined for the following additive solutions (in kg): methyl dichlorostearate, 126; tetrachloronaphthalene, 126; chlorinated paraffin C₂₅H₅₁Cl, 79; much
Card 1/2

Effect of synthetic lubricating...

29447
S/081/61/000/017/149/166
B117/B138

higher chlorinated paraffin $C_{25}H_{40}Cl_{12}$, $(n-C_3H_7S)_3P$, 110; $(n-C_{18}H_{37}S)_3P$, 68; $(C_4H_9O)_3PO$, 102; $(C_4H_9S)_3PS$, 69. An introduction of 1, 2, 3, and 4 S atoms in transition from $(C_4H_9O)_3PO$ to $(C_4H_9S)_3PS$ reduced the SL, but decreased the wear with loads above SL. Particularly high SL were obtained for compounds with molecules containing P and CCl_3 groups: $(C_4H_9O)_2P(O)CCl_3$ (the SL is 2.5 times higher than for pure oil), $(CCl_3CH_2O)_3P$ (SL > 300), and tri-(trichloro-tert-butyl)-phosphite (SL > 300). At the same time these compounds reduce wear with loads above SL. [Abstracter's note: Complete translation.]

Card 2/2

PETROV, A.I.A.; SERGIYENKO, S.R.; TSEDILINA, A.I.; SANIN, P.I.; NIKITSKAYA, Ye.A.; NECHITAYLO, N.A.

Synthesis and properties of high molecular weight hydrocarbons of mixed structure. Report No. 1: Synthesis of hydrocarbons of the composition C_{24} . Izv. AN SSSR Otd. khim. nauk no.10;1848-1857 0 '60.
(MIRA 13:10)

1. Institut geologii i razrabotki goryuchikh iskopayemykh Akademii nauk SSSR.

(Hydrocarbons)

S/191/60/000/011/013/016
B013/B054

AUTHORS: Nechitaylo, N. A., Tolchinskiy, I. M., Sanin, P. I.
TITLE: Use of Thermal Analysis to Study the Destruction of Polymers
PERIODICAL: Plasticheskiye massy, 1960, No. 11, pp. 54-57

TEXT: The present paper gives heating curves for some polymers in the temperature range of from 20° to 800° - 900° C, and discusses the possibility of using thermal analysis for the study of destruction processes with the aid of the results obtained. Three polyethylene samples and one polypropylene sample of high molecular weight were investigated. The heating curves for the samples were plotted by a Kurnakov automatic recording photopyrometer. On heating the samples in the absence of oxygen in vacuo or an inert gas medium, only those thermal effects were fixed which were connected with the melting of crystallites (Fig. 1). It was found that the transition from the elastic-amorphous to the viscous state took place in the range of 350° - 550° C, and - as expected - was not accompanied by a thermal effect. The curves plotted on heating the samples in the presence of oxygen looked differently (Figs. 2 and 3). Both endothermic and exo-

Card 1/2

Use of Thermal Analysis to Study the
Destruction of Polymers

S/191/60/000/011/013/016
B013/B054

thermic effects can be observed on these curves; they correspond to the reactions of oxidation and destruction of polymers. A table gives the temperatures of phase transformations for polyethylene and polypropylene samples. The more or less similar thermograms (Figs. 2 and 3) indicate a similar character of high-temperature oxidation and destruction of the polymers examined (Refs. 3 and 5). The thermogram for the amorphous polypropylene fraction has a slightly different form. Except for this fraction, all thermograms show more or less distinctly marked exothermic effects in the region of 200°C. On the basis of the heating curves examined, thermal analysis seems to be a suitable method of studying oxidation and destruction of polymers. It may be assumed that with the aid of thermal analysis it will also be possible to determine the efficiency of stabilizers of the antioxidant type. This should facilitate their efficient choice for polymers of various types. V. A. Kargin and T. I. Sogolova are mentioned. There are 4 figures, 1 table, and 14 references: 8 Soviet, 3 US, 1 British, and 1 Italian.

Card 2/2

SANIN, P. I.

38688

S/510/60/014/000/001/006

D244/D307

5.3200

AUTHORS: Topchiyev, A.V., Nifontova, S.S., Musayev, I.A., Sanin, P. I., Suchkova, A.A., Sushchik, R.Ya., and Chekalova, N.N.

TITLE: Method of isolating aromatic hydrocarbons from medium (kerosene) fractions of petroleum

SOURCE: Akademiya nauk SSSR. Institut nefti. Trudy, v. 14, 1960, Khimiya nefti, 12 - 57

TEXT: Results are given of the separation of crude Romashinsk petroleum into distillation fractions, separation of aromatic hydrocarbons from the 175 - 300°C fractions, separation of the aromatic fractions into structural types and a study of group-structural composition of the monocyclic aromatic hydrocarbons. The crude material was from the Aktashsk area, Mikhaylovsk level, (depth 1583 - 1585 m).

Properties of the crude oil were as follows: d_4^{20} 0.8612, flash point 35°C, viscosity 7.13 cs at 50°C, and 2.84 cs at 100°C, wax content - 4.9 % melting point of wax 50°C, content of silica gel resins - 9.86 %, asphaltene content 2.9 %, elemental composition C 84.85 %, H
Card 1/3

Method of isolating aromatic ...

S/510/60/014/000/001/006
D244/D307

12.85 %, N 0.53 %, O 0.26 % and S 1.83 %. It was shown that narrow fractions of aromatic hydrocarbons can be separated by silica gel chromatography from a broad aromatic fraction from the 175 - 300° cut. Individual hydrocarbons were oxidized with a 30 % solution of H_2O_2 at 75 - 80°C. It was shown that the hydrocarbon components are not oxidized under these conditions. However the aromatic fractions having n_D^{20} from 1.4950 to 1.55 underwent desulphurization. It was possible to use home produced Al_2O_3 to separate quantitatively synthetic binary mixtures of monocyclic and bicyclic hydrocarbons. The napthene aromatic hydrocarbons of the type: cyclopentyltoluene, tetralin and indane mixed with tertiary iso-butyl-o-xylol were not well separated under the conditions used. The optimum conditions for the Al_2O_3 separation of the aromatic fractions into monocyclic and bicyclic hydrocarbons were: Oil charge 30 g, column height 2 m, (composed of three parts) the diameter decreasing from 53 mm at the top to 20 mm at the bottom. Iso-octane, benzene and iso-propyl alcohol were used as eluents. The hydrocarbon composition of the 175 - 300°C

Card 2/3

Method of isolating aromatic ...

S/510/60/014/000/001/006
D244/D307

cut of the Romashinsk crude oil was as follows: Monocyclic aromatics hydrocarbons 13.11 %, bicyclic aromatic hydrocarbons 3.01 %, mixed aromatics 0.7 %, hexamethylene hydrocarbons 6.4 %, pentamethylene hydrocarbons 11.5 %, normal paraffins 17.5 %, iso-paraffins 41.2 % and organic compounds of S 6.58 %. Examination of the uv spectra of the narrow fractions obtained from the broad aromatic fractions having $n_D^{20} = 1.49 - 1.50$ and $1.50 - 1.51$ established that they consist mainly of tetrasubstituted alkylaromatic hydrocarbons. There are 16 figures and 5 tables.

✓

Card 3/3

Synthesis and properties of anti-wear ... S/510/60/014/000/006/006
D244/D307

Esters $\text{CCl}_3 \text{P} (\text{OR})_2$ increased the critical load to a value more than twice of that for the base oil and decreased the wear considerably in the region of high loads. It was established that the specific activity of the compounds containing CCl_3 group is due to a high reactivity of Cl in the group with metal surfaces, on which a chloride film is formed. The wear reducing properties of additives of the $\text{CCl}_3 \text{P} (\text{OR})_2$ type is due to the simultaneous action of the reactive Cl and P resulting in the formation of chloride and phosphide films on the rubbing metal surfaces. There are 12 figures and 9 tables. ✓

Card 3/3

27423

Z/011/61/018/002/006/013
E112/E153

156400

AUTHORS: Sanin, P.I., Shepeleva, Ye.S., and others
TITLE: Some data about the activity of compounds containing the- CCl_3 -group

PERIODICAL: Chemie a chemická technologie. Přehled technické a hospodářské literatury. Vol.18, No.2, 1961, page 78, Abstract Ch 61-1070 (Khim. Tekhnol. Topliva, 1960, VIII, Vol.5, No.8, pp.24-28)

TEXT: The antiabrasive action of compounds containing the above group was determined and compared. It was shown that in analogy to the tetrachloroalkanes, the activity is caused by the relatively high lability of chlorine, which forms a chloride film on the surface of the metal. Greater activities are displayed by compounds which in addition to $-\text{CCl}_3$, contain phosphorus, such as the esters of trichloromethyl-phosphinic acid.
3 diagrams, 3 tables, 11 lit.references.

[Abstractor's note: This is a complete translation.]

Card 1/1

KLEYMENOV, B.V., SANIN, P.I.

Mobile table for a microscope measuring the wear of steel balls. Zav.lab. 26 no.7:884-885 '60. (MIRA 13:7)

1. Institut neftekhimicheskogo sinteza Akademii nauk SSSR.
(Microscopy) (Ball bearings--Testing)

S/080/60/033/04/29/045

AUTHORS: Sanin, P.I., Petrov, A.I.A., Sergiyenko, S.R., Nikitskaya, Ye.A.TITLE: The Viscosity Properties of Some Cyclic Hydrocarbons of the Composition C_{24}

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 4, pp 919 - 930

TEXT: The viscosity properties of 22 hydrocarbons of the composition C_{24} were studied within the temperature range from 150 to $-40^{\circ}C$. The results are shown in 2 tables. The study of viscosity properties of bicyclic and tricyclic hydrocarbons of the composition C_{24} containing isolated hexamethylene and benzene rings showed that the transition from an aliphatic hydrocarbon not containing cycles to mono-, di- and tricyclic hydrocarbons (by substitution of the hexyl group by a hexamethylene or benzene ring) is accompanied by an increase in the viscosity and a deterioration of the temperature dependence of the viscosity. Bicyclic aromatic hydrocarbons containing methylated benzene rings are distinguished by a considerably higher viscosity than the corresponding hydrocarbons with non-methylated benzene rings. Naphthene hydrocarbons formed during hydrogenation of aromatic hydrocarbons, which do not contain alkyl groups in the benzene ring, have a higher viscosity and a correspondingly weaker temperature dependence than the

Card 1/2

S/080/60/033/04/29/045

The Viscosity Properties of Some Cyclic Hydrocarbons of the Composition C_{24}

initial aromatic hydrocarbons. The opposite is observed in the case of hydrogenation of aromatic hydrocarbons containing methylated benzene rings. In this case hydrogenation leads to a decrease of viscosity, which is especially considerable for hydrocarbons with disubstituted rings; the temperature dependence of viscosity improves correspondingly. The phenomenon observed, which was noted earlier for condensed polycyclic aromatic hydrocarbons, should be allowed for in the investigation of higher aromatic petroleum fractions by the hydrogenation method.

There are: 3 graphs, 3 tables and 20 references, 9 of which are Soviet, 5 English, 3 American and 3 German

ASSOCIATION: Institut neftekhimicheskogo sinteza AN SSSR i Institut geologii i razrabotki goryuchikh iskopayemykh AN SSSR (Institute of Petrochemical Synthesis of the AS USSR and Institute of Geology and Development of Mineral Fuels of the AS USSR)

SUBMITTED: October 3, 1959

Card 2/2

5.3300(B)

67570

5(3)

SOV/20-130-2-26/69

AUTHORS: Sanin, P. I., Petrov, Al. A., Sergiyenko, S. R., Academician
AS Turkm SSR, Nikitskaya, Ye. A.

TITLE: Viscosity¹ Properties of Alkyl-aromatic Hydrocarbons and
Their Hydrogenated Analogs

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 130, Nr 2, pp 338 - 340
(USSR)

ABSTRACT: An investigation of the viscosity of aromatic hydrocarbons containing isolated benzene rings, and their hydrogenated analogs, showed (Table 1) that the change in viscosity on hydrogenation considerably depends on the structure of the hydrocarbons. Hydrogenation of certain structures reduces the viscosity extraordinarily. The aromatic hydrocarbons¹ (C₂₄) investigated here may be divided into 2 groups: 1) without substituents on the ring (Table 1, Nrs 1-5); 2) with methyl groups on the ring (Nrs 6-8). Hydrogenation (or transformation of aromatic into naphthene hydrocarbons, respectively) of the hydrocarbons of the 1st group increases the viscosity, and causes a higher viscosity increase with de-

Card 1/3

67370

Viscosity Properties of Alkyl-aromatic Hydrocarbons and SOV/20-130-2-26/69
Their Hydrogenated Analogs

creasing temperature. According to the data obtained by the authors, this known phenomenon also applies to polycyclic aromatic hydrocarbons with isolated benzene rings (without alkyl groups as substituents on the ring). Hydrogenation of bicyclic aromatic hydrocarbons with methyl groups on the benzene ring (Nrs 6-8) produced naphthene hydrocarbons with considerably lower viscosity than that of their initial substances. The viscosity decreased more in the hydrocarbons with 2 methyl groups on the ring. This dependence is contrary to that observed in hydrocarbons without substituents on the ring. Table 2 shows comparative data of the viscosity for both types of hydrocarbons. The above phenomenon is of general importance to the dependence of viscosity of hydrocarbons on their structure. It also renders possible a new interpretation of some results of hydrogenation of aromatic petroleum fractions. Thus, the viscosity of synthetic polycyclic aromatic hydrocarbons consisting of condensed benzene rings is reduced by hydrogenation while the viscosity index rises. The contrary applies to hydrogenation of aromatic hydrocarbons containing isolated benzene rings (Refs 1,2).

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67570

Viscosity Properties of Alkyl-aromatic Hydrocarbons and SOV/20-130-2-26/69
Their Hydrogenated Analogs

The data obtained by the authors make it possible to assert that the viscosity on hydrogenation of the higher-boiling petroleum fractions may also be reduced by the presence of polycyclic aromatic hydrocarbons with isolated benzene rings containing alkyl- (methyl-) groups on the ring. The cause of the viscosity change of some types of aromatic hydrocarbons on hydrogenation is unknown and must be investigated yet. There are 2 tables and 4 references, 3 of which are Soviet.

ASSOCIATION: Institut neftekhimicheskogo sinteza Akademii nauk SSSR (Institute of Petroleum-chemical Synthesis of the Academy of Sciences, USSR). Institut geologii i razrabotki goryuchikh iskopayemykh Akademii nauk SSSR (Institute of Geology and the Working of Combustible Minerals of the Academy of Sciences, USSR)

SUBMITTED: September 22, 1959

Card 3/3

5.3630

80064

S/020/60/132/01/38/064
B011/B126AUTHORS: Sanin, P. I., Voronkov, M. G., Shepeleva, Ye. S., Ionin, B. I.TITLE: The Interaction Between Dialkyl-phosphorous Acids¹ and Quinones¹

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 1, pp. 145-148

TEXT: The organophosphorus compounds are highly active as additions to lubricating oils (Refs. 1-3). Some derivatives of dithiophosphorous, phosphoric, and phosphorous acids belong to them. The authors have taken the trouble to obtain organophosphorus compounds which are, amongst other things, also anti-oxidants, which hinder the oxidation¹ of hydrocarbons¹ by atmospheric oxygen. Thus, the authors tried to add acid esters of the phosphorous acid to the quinones. The reaction of dialkyl-phosphorous acids or phosphites with p-benzoquinone can take place in two ways and lead to: a) esters of dihydroxyphenylphosphoric acids (I) and (II), or b) compounds in which phosphorus is bonded with oxygen (III) and (IV) (Ref. 11). The authors have established that dialkyl-p-oxyphenylphosphates are formed on the reaction of dialkylphosphorous acids with p-benzoquinone. As a result, the phosphorous group adds to the oxygen atom of the benzoquinone (see scheme). This addition is accompanied by a conversion of the

Card 1/3

The Interaction Between Dialkyl-phosphorous Acids and Quinones

80064
S/020/60/132/01/38/064
B011/B126

quinoid structure into a benzoid structure. The reaction between dialkylphosphorous acids and α -naphthoquinone is similar. Table 1 shows the melting temperatures and the results of analyses of the compounds produced. They are crystalline substances, soluble in aqueous alkali solutions. They give the characteristic color reaction for phenylhydroxyl with ferric chloride, but no reaction for the carbonyl group. The hydrolysis of the substances obtained with HCl (1:1), and the saponification with alcoholic alkalis at 40-50° gives a yield of 80%. All compounds produced contain only one hydroxyl group. On the basis of the ultraviolet absorption spectra the authors have stated that esters of p-oxyphenyl-phosphorous acid are concerned. As can be seen from table 2, the absorption maximum of the products is shifted towards short waves, and agrees with the maximum of dimethyl-p-methoxyphenylphosphate. Thus, the results given above show that the said substances are really dialkyl-p-oxyphenylphosphates (see scheme). The following were also quoted: V. S. Abramov, A. N. Pudovik, Yu. P. Kitayev, and G. Zametayeva. There are 2 tables and 18 references, 10 of which are Soviet.

ASSOCIATION: Institut neftekhimicheskogo sinteza Akademii nauk SSSR (Institute of Petroleum-chemical Synthesis of the Academy of Sciences, USSR)

Card 2/3

TOPCHIEV, A.V., akademik; NIFONTOVA, S.S.; MUSAYEV, I.A.; SANIN, R.I.;
SUCHKOVA, A.A.; SUSHCHIK, R.Ya.; CHEKALOVA, N.N.

Method of separating aromatic hydrocarbons from middle (kerosine)
petroleum fractions. Dokl. AN SSSR 134 no.6:1378-1380 0' '60.
(MIRA 13:10)

1. Institut neftekhimicheskogo sinteza Akademii nauk SSSR.
(Hydrocarbons) (Chromatographic analysis)

SANIN, P. I.

SCV/5055

PHASE I BOOK EXPLOITATION

Vsesoyuznaya konferentsiya po treniyu i iznosu v mashinakh. 3d, 1956.

Gidrodinamicheskaya teoriya smazki. Oprey skol'zheniya. Smazka i smazochnyye materialy (Hydrodynamic Theory of Lubrication, Slip Bearings. Lubrication and Lubricant Materials). Moscow, Izd-vo AN SSSR, 422 p. Errata slip inserted. 3,500 copies printed. (Series: Ita; Trudy, v. 3)

Sponsoring Agency: Akademiya nauk SSSR, Institut mashinovedeniya, Resp. Eds. for the Section "Hydrodynamic Theory of Lubrication and Slip Bearings"; Ye. M. Gut'ya, Professor, Doctor of Technical Sciences, and A. I. D'yachkov, Professor, Doctor of Technical Sciences; Resp. Ed. for the Section "Lubrication and Lubricant Materials": G. V. Vinogradov, Professor, Doctor of Chemical Sciences; Ed. of Publishing House: M. Ya. Kiselev; Tech. Ed.: G. N. Gus'kova.

PURPOSE: This collection of articles is intended for practicing engineers and research scientists.

COVERAGE: The collection, published by the Institut mashinovedeniya AN SSSR (Institute of Science of Machines, Academy of Sciences USSR) contains papers presented at the III Vsesoyuznaya konferentsiya po treniyu i iznosu v mashinakh (Third All-Union Conference on Friction and Wear in Machines) which was held April 9-15, 1956. Problems discussed were in the field of "Hydrodynamic Theory of Lubrication and Lubricant Materials".

Hydrodynamic Theory (Cont.)

Podolskiy, Yu. Ya. Machine for Testing Wear-Resistant and Antifriction Properties of Lubricant Materials for High Contact Stresses and Sliding Speeds 227

Santa, P. I., Ye. S. Shepelov, A. V. Ul'yanova, and A. V. Kiselev. Effect of Synthetic Additives to Lubricating Oils on Frictional Wear 234

Trukhan, I. G. Application of the Results of Wear-Resistance Tests of Lubricating Oils on Machines With Point Contact of the Friction Surfaces 239

Volumetric Mechanical Properties of Lubricant Materials

Velikovskiy, D. S. (deceased), E. I. Kishin, and G. D. Bondarevskiy. Viscous Properties of Oil Mixtures of Different Chemical Character and of Solid Lubricants Obtained by Thickening 248

Velikovskiy, D. S. and V. L. Val'dman. Investigation of the Viscous Properties of Lubricating Oils with High-Polymer Additives at Low Temperatures 256

Kusakov, M. M., L. A. Konovaleva, Ya. A. Prokof'eva, and V. I. Sidorenko. Effect of Temperature and Pressure on the Viscosity of Mixtures of Mineral Oils and Silico-organic Liquids 262

Mashchenkov, S. M. Practical Significance of Some Laboratory Parameters of the Mechanical Properties of Plastic Lubricants 270

Parlov, V. P. Effects of Heat on the Flow of Plastic Lubricants 277

Sinitzyn, V. V. Boundary-Layer Sliding and Internal Friction of Plastic Lubricants 284

100-1047

FEDYNSKIY, V.V., doktor fiziko-matem. nauk, red.; LEVINSON, V.G., kand. geol.-mineral. nauk, red.; TOPCHIEV, A.V., akad. NAGIYEV, M.F., akad., red.; SHUYKIN, N.I., red.; MIRCHINK, M.F., red.; TREBIN, F.A., doktor tekhn. nauk, red.; SANIN, P.I., doktor khim. nauk; SUKHANOV, V.P., inzh., red.; PANOV, V.V., kand. tekhn. nauk, red.; IONEL', A.G., vedushchiy red.; ZARETSKAYA, A.I., vedushchiy red.; FEDOTOVA, I.G., tekhn. red.

[Reports of the International Petroleum Congress. 5th New York, 1959] Doklady V Mezhdunarodnogo neftianogo kongressa, New York, 1959. Moskva, Gos. nauchno-tekhn. izd-vo neft. i gorno-toplivnoi lit-ry. Vol.1. [Geology and geophysics] Geologiya i geofizika. Pod red. V.V. Fedynskogo i V.G.Levinsona. 1961. 382 p. (MIRA 14:9)

1. International Petroleum Congress. 5th, New York, 1959. 2. AN Azerbaydzhanskoy SSR (for Nagiyev). 3. Chleny-korrespondenty AN SSSR (for Shuykin, Mirchink).
(Petroleum geology) (Gas, Natural—Geology)
(Prospecting—Geophysical methods)

KREYN, S.E., red.; SANIN, P.I., red.; MONASTYRSKIY, V.N., red.; EMINOV, Ye.A., red.; LEVINA, Ye.S., vedushchiy red.; TITSKAYA, B.F., vedushchiy red.; POLOSINA, A.S., tekhn. red.

[Additives to oils and fuels; papers read at a scientific and technical conference] Prisdki k maslam i toplivam; trudy nauchno-tekhn. soveshchaniia. Pod red. S.E.Kreina i dr. Moskva, Gos. nauchno-tekhn. izd-vo neft. i gorno-toplivnoi lit-ry, 1961. 394 p.
(MIRA 14:11)

1. Vsesoyuznoye nauchno-tekhnicheskoye soveshchaniye po prisdkam k maslam i toplivam, 1960. 2. Institut neftekhimicheskogo sinteza AN SSSR (for Sanin). 3. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza i polucheniyu iskusstvennogo zhidkogo topliva (for Monastyrskiy).

(Fuel—Additives) (Lubrication and lubricants—Additives)

36358
S/081/62/000/005/090/112
B162/B101

11.9700
AUTHORS:

Sanin, P. I., Sher, V. V., Vipper, A. B., Glukhoded, I. S.,
Nikitskaya, Ye. A.

TITLE:

Investigation of additives of the type of metal dialkyl
dithiophosphates

PERIODICAL:

Referativnyy zhurnal. Khimiya, no. 5, 1962, 530,
abstract 5M230 (Sb. "Prisadki k maslam i toplivam",
M., Gostoptekhizdat, 1961, 26-34)

TEXT: As a result of the synthesis and investigation of a series of
technical additives of the type of dialkyl dithiophosphates (DP) of Ba and
Zn, it is established that these additives have washing, anticorrosion, and
antiwear properties, are antioxidants and some of them depressors and
de-emulsifiers. Certain properties of DP as additives to lubricating oils
appear in different degrees and depend on the structure of the additives.
The properties of the additives which depend on their surface activity
(washing and de-emulsifying action, partly anticorrosion action, drop in

Card 1/2

35554

S/081/62/000/006/090/117
B167/B101

11.9701

AUTHORS: Shepeleva, Ye. S., Sanin, P. I.

TITLE: Organo-phosphorus chloro-compounds as wear-inhibiting additives under conditions of limiting friction

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 6, 1962, 542, abstract 6M264 (Sb. "Prisadki k maslam i toplivam". M., Gostoptekhzdat, 1961, 67-70)

TEXT: Additives for lubricating oils which contain P and the CCl_3 group, such as phosphate esters containing CCl_3 in their (alkyl) ester groups, and the esters of trichloromethyl phosphinic acid, are found to be very effective. A technical synthesis of dibutyl trichloromethyl phosphite (I), suitable for large-scale operation, has been developed. 1 mole of the tributyl phosphite and 2 moles of CCl_4 are refluxed for 6 hrs, the excess of CCl_4 and the by-product (butyl chloride) are distilled off in a vacuum of 30 mm Hg, and the residue is distilled in a vacuum of 3 mm Hg

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Organo-phosphorus chloro-compounds ...

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B167/B101

to give a fraction of technical I in 70% yield (n_D^{20} 1.4580, d_4^{20} 1.1996, Cl found 30% as against 34.1% theoretical yield). Technical I is the antiwear additive $\chi_{\text{acp}\phi}$ -40 (Khloref-40), which gave positive test-bench results as a transmission oil additive. [Abstracter's note: Complete translation.]

Card 2/2

36934
S/081/62/000/007/026/033
B168/B101

11.9700

AUTHORS: Sanin, P. I., Sher, V. V., Chernyavskaya, L. F., Melent'yeva,
N. V., Glukhoded, I. S.

TITLE: Dialkyldithiophosphates of metals as anti-oxidants for
lubricating oils

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 7, 1962, 548, abstract
7M184 (Sb. "Prisadki k maslam i toplivam". M.,
Gostoptekhizdat, 1961, 85-94)

TEXT: The influence of dialkyldithiophosphates of metals of different
structures (in the form of industrial additives $\Delta\Phi$ -1 (DF-1), $\Delta\Phi$ -2 (DF-2),
 $\Delta\Phi$ -5 (DF-5), $\Delta\Phi$ -8 (DF-8), $\Delta\Phi$ -9 (DF-9), $\Delta\Phi$ -10 (DF-10), $\Delta\Phi$ -11 (DF-11),
and $\Delta\Phi$ -12 (DF-12)) on the oxidation of oil ΔC -8 (DS-8) (from sulfur-
containing petroleums) and its hydrocarbon fractions, separated
chromatographically, was investigated. Oxidation of the oil was determined
from oxygen absorption in a closed system. The anti-oxidant action of the
dialkyldithiophosphates in the paraffin-naphthene fraction was considerable
at test temperatures of 120-150°C; it depended on the structure of the

Card 1/2

Dialkyldithiophosphates of ...

S/081/62/000/007/026/033
B168/B101

additive and falling as the temperature rose, to reach a negligible value at 200°C. The additive DF-1 (barium dialkyldithiophosphate with the alkyls C₂₀-C₂₄) was found to be the most powerful anti-oxidant, having an effectiveness roughly equal to that of ionol. In the paraffin-naphthene fraction the additives of sulfonate type (азнии-4 (aznii-4) washing component of азнии-5 (aznii-5) and ПМС_Я (PMS_{Ya})) and of alkylphenolate type (ВНИИ НП-350 (vnii np-350)) did not greatly reduce the rate of oxidation. Much more active in the same fraction of oil were the additives of alkylphenolate type, which also contain sulfur or phosphorus in the form of sulfides and dithiophosphates (цнатим-339 (tsiatim-339), Паранокс-56А (Paranox-56A), ВНИИ НП-360 (vnii np-360), ВНИИ НП-361 (vnii np-361), ИП-22к (IP-22k), although their effectiveness was lower than that of additive DF-1. The additive DF-1 did not reduce the rate of oxidation of oil DS-8, which contains natural inhibitors and is sufficiently stable without additives. The oil becomes unstable in the presence of metals (Cu, Fe and CuO), when the natural inhibitors are not sufficiently effective. The inhibitor DF-1 passivated the metals and raised the stability of the oil to approximately the same value as in the absence of metals.

[Abstracter's note: Complete translation.]

Card 2/2

40293
S/081/62/000/014/025/039
B166/B144

11.9700
AUTHORS: Sanin, P. I., Chernyavskaya, L. F., Sher, V. V.,
Melent'yeva, N. V.

TITLE: On the mechanism of the detergent action of additives

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 14, 1962, 536, abstract
14M237 (Sb. "Prisadki k maslam i toplivam." M.,
Gostoptekhizdat, 1961, 174 - 184)

TEXT: The action of dialkyl-dithio phosphates of Ni ((I) di-n-butyl-,
di-n-decyl- and di-n-octadecyl thiophosphate) as model detergent
additives to motor oils was studied. Surface tension isotherms were taken
of solutions of (I) in benzene and heptane on the solvent - water interface;
also adsorption isotherms of (I) on carbon black suspended in toluene.
These isotherms show that I are surfactants and are adsorbed both on the
hydrocarbon - water interface and on the surface of carbon black. Com-
parison of electron microscope photographs (magnification x 15,700) of
carbon black collected from its suspensions in toluene with and without
(I) shows that (I) prevent agglutination of particles of carbon black,

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S/081/62/000/014/025/039
B166/B144

On the mechanism of the...

or that they separate large carbon black aggregates which have already agglutinated. The maximum number of molecules of I adsorbed by one particle of thermal black or channel black is calculated from the average diameter of the particles of carbon black in suspension, determined from the photograph (720 \AA for thermal black and 306 \AA for channel black), and from the maximum quantity of adsorbed (I); the following respective values being obtained: $47.7 \cdot 10^7$ and $10.2 \cdot 10^4$ molecules for di-n-butyl-dithio phosphate, $20.5 \cdot 10^7$ and $7.3 \cdot 10^4$ molecules for di-n-decyl-dithio phosphate, $17.5 \cdot 10^7$ and $5.7 \cdot 10^4$ molecules for di-n-dioctadecyl-dithio phosphate. The stabilization of a suspension of carbon black in toluene in the presence of (I) was studied by determining the full sedimentation time of the carbon black when at rest, or by centrifuging and determining the change in the concentration of carbon black in suspension with time. It was found that (I) have a considerable stabilizing effect even at a concentration of 0.1%, whereas the disulphide $[(C_{18}H_{37}O)_2P(S)S^-]_2$, which has a similar structure, produces almost none of this effect and imparts

Card 2/3

On the mechanism of the...

S/081/62/000/014/025/039
B166/B144

no detergent properties to motor oils. Di-n-octadecyl-dithio phosphate of Zn is considerably less active as a stabilizer of a suspension of carbon black than di-n-octadecyl-dithio phosphate of Ni, which corresponds to their relative detergent efficiency in motor oils. It is concluded that detergent additives, which should more correctly be called dispersive additives, in motor oils are adsorbed on the surfaces of oil-insoluble particles which form when the oil is working, whereby they prevent these particles flocculating and also prevent their deposition on parts of the engine. 31 references. See also RZhKhim, 1962, 5M219. [Abstracter's note: Complete translation.]

Card 3/3

36567

S/081/62/000/006/084/117
B167/B101

11-9700

AUTHORS:

Sanin, P. I., Ul'yanova, A. V.

TITLE:

Organo-phosphorus compounds which decrease frictional wear.
Mechanism of action

PERIODICAL:

Referativnyy zhurnal. Khimiya, no. 6, 1962, 540, abstract
6M253 (Sb. "Prisadki k maslam i toplivam". M.,
Gostoptekhizdat, 1961, 189-197)

TEXT: A study of the anti-wear properties of trioctadecyl phosphite (I), tributyl phosphite (II), and tributyl trithiophosphite (III). 0.02 moles were heated in a stream of dry N_2 , and the decomposition products in the effluent N_2 were absorbed in suitable solutions. I begins to decompose at $\sim 240^\circ C$, decomposition being effectively complete at $250-260^\circ C$. II showed an induction period of ~ 2 hours at $240^\circ C$, and was almost completely decomposed in 2 hours at $270^\circ C$. Both decompositions are described by the equation $4(C_{n-2n+1}O)_3P \rightarrow 3H_3PO_4 + PH_3 + 12C_nH_{2n}$. Tributyl trithiophosphite

Card 1/2

Organo-phosphorus compounds which ...

S/081/62/000/C06/084/117
B167/B101

decomposes at 250-280° by the process $4(C_4H_9S)_3P \rightarrow 3H_3PS_4 + PH_3 + 12C_4H_8$; $2H_3PS_4 \rightarrow 3H_2S + P_2S_5$. The attack on metals by the PH_3 evolved from the decomposition of phosphites used as anti-wear additives was demonstrated by carrying out decompositions of I (4 g) in the presence (4 g) of reduced Fe, Fe_3O_4 , reduced Cu, and CuO (all in powder form). Decomposition occurred at 250-260°C, except in the CuO experiment (210-225°C); only 0-10% of the theoretical amount of PH_3 was actually evolved, the remainder being detected quantitatively as phosphide P in the non-volatile residue of the Fe experiment. In the other experiments, P was quantitatively determined in the non-volatile decomposition residues. II decomposed in the presence of the same metals and oxides, also forming metallic phosphides. With Cu and CuO the reaction temperature was lower than in the case of I (140-190°C). [Abstracter's note: Complete translation.] X

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S/081/62/000/005/077/112
B162/B101

AUTHORS: Kusakov, M. M., Sanin, P. I., Razumovskaya, E. A.,
Ul'yanova, A. V., Dekartov, A. P.

TITLE: Investigation of the mechanism of interaction of tributyl
trithiophosphite in a hydrocarbon medium with thin layers of
copper by the radioactive indicator method

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 5, 1962, 527,
abstract 5M209 (Sb. "Prisadki k maslam i toplivam".
M., Gostoptekhnizdat, 1961, 207-213)

TEXT: An investigation is made of the kinetics of the interaction of
tributyl trithiophosphite (I) solutions labeled with S^{35} , P^{32} , or C^{14} , in
the naphtheneparaffin fraction of MS-20 (MS-20) oil at temperatures from
70 to 130°C with thin layers of copper (from 70 to 1000 Å), obtained by
the method of evaporation copper in vacuum and deposited on a degreased

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Investigation of the mechanism ...

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glass; concentration of I in oil is 0.1 moles/liter. It is shown that in the interaction of the solution I with copper films are formed which contain S, P, and C. It is assumed that I, on reacting with copper at an increased temperature, decomposes according to the equation $8I \rightarrow 2PH_3 + 9C_4H_9SH + 15C_4H_8 + 3P_2S_5$. The separated C_4H_9SH with copper forms $(C_4H_9S)_2Cu$ which, at an increased temperature, decomposes into $CuS + 2C_4H_8 + H_2S$, and PH_3 with copper forms phosphide. It is concluded that the films which are formed in the interaction of I with copper contain sulfide, phosphide, and mercaptide of copper, and the product of reaction of the hydrocarbon radical I with copper. [Abstracter's note: Complete translation.]

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NECHITAYLO, N.A.; SANIN, P.I.; TOLCHINSKIY, I.M.; Prinimali uchastiye:
DZYUBINA, M.A.; SHIROKOVA, L.A.

Melting heat of polymers. Plast.massy no.8:3-5 '61. (MIRA 14:7)
(Polymers) (Heat of fusion)

15.6600

28782
S/065/61/000/011/002/004
EO30/E135

11.9700

AUTHORS: Sanin, P.I., Vipper, A.B., Sher, V.V., and
Kleymenova, Z.A.

TITLE: Investigation of the simultaneous effect of additives
of sulphonates and dialkyldithiophosphate metals

PERIODICAL: Khimiya i tekhnologiya topliv i masel, no.11, 1961,
19-23

TEXT: The effects have been studied of adding simultaneously
thiophosphate and sulphonate additives to oils for high-speed
engines. The base oil studied was $\Delta C-8$ (DS-8), which contains
86% distillate and 14% residue from high-sulphur crudes. The
additives were the following dialkyldithiophosphates: $\Delta\phi-I$
(DF-I) which is a barium salt derived from high-molecular weight
alcohols ($C_{20} - C_{24}$), and $\Delta\phi-II$ (DF-II) which is a zinc salt
derived from isobutyl and isooctyl alcohols; and the following
sulphonates: A_3HMI-5 (AzNII-5) a barium salt of sulphonated
petrolatum, and C_6-3 (SB-3) a barium salt of the acid obtained by
sulphonating selectively refined diesel oil. The base oil
properties were studied and measurements repeated on addition of
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Investigation of the simultaneous S/065/61/000/011/002/004
E030/E135

each additive individually (AzNII-5 up to 3%, SB-3 up to 10%, and the DF- additives up to 3.5) and then, on addition of each of the sulphonates along with each of the dithiophosphates. Tests were carried out (results being quoted on Soviet test methods) on: thermal oxidation stability (as minutes at T₂₅₀), detergency in "units" on apparatus ПЗВ (PZV), de-emulsifying power (in % of unseparated emulsion), corrosivity (g/m² on apparatus ДК-2 (DK-2), and critical load (P_k, kg). It was found that addition of 1-2% dithiophosphate additive along with 3% sulphonate additive gave much better improvement than even 10% of sulphonate alone. It was found that DF-I was more effective than DF-II in all respects except anti-wear; the optimum concentration of DF-I is 1% but for anti-wear, DF-II is necessary, the optimum being 2%. All these results refer to addition with sulphonates. A detailed analysis was made of oxidation, adsorbing the tested oils in silica gel and desorbing in benzyl alcohol. SB-3 inhibited formation of carbenes and carboids, but AzNII-5 is a pro-oxidant, favouring combination of resins with oxy-acids; in their presence, both DF- additives were strong anti-oxidants,

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Investigation of the simultaneous ... S/065/61/000/011/002/004
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greatly reducing the formation of insoluble matter.

There are 3 tables and 5 Soviet-bloc references.

ASSOCIATION: Institut neftekhimicheskogo sinteza AN SSSR
(Institute of Petrochemical Synthesis, AS USSR)

Card 3/3

TERENT'YEVA, Ye.M.; SANIN, P.I.; STEPANTSEVA, T.G.; KUSAKOV, M.M.;
SHIMANKO, N.A.; SIDORENKO, V.I.

Synthesis and investigation of the ultraviolet absorption spectra
of hydrocarbons of the 1,1-diphenylethane series. Neftekhimiia
1 no.2:141-148 Mr.-Ap '61. (MIRA 15:2)

1. Institut neftekhimicheskogo sinteza AN SSSR.
(Hydrocarbons--Spectra)

1 20321-63 EPE(c)/EWT(m)/SDS AFETC/APCC Pr-4 EW/WH/DI
 S/2664/61/000/000/0174/0184
 ACCESSION NR: AT3001987

AUTHORS: Sanin, P. I.; Charnyavskaya, L. F.; Sher, V. V.; Melent'yeva, N. V.

TITLE: The mechanism of the action of additives. // On the mechanism of the detergent action of additives. //

SOURCE: Prisadki k maslam i toplivam; trudy nauchno-tekhnicheskogo soveshchaniya. Moscow, Gostoptekhizdat, 1961, 174-184.

TOPIC TAGS: lubricant, lubrication, additive, detergent, detergence, dispersive, dispergator, peptizing, agent, peptizator, suspension, adsorption, adsorptive flocculation, Ni, dialkyldithiophosphate, toluene.

ABSTRACT: This paper combines an extensive literature survey on the mechanism of the detergent action of additives with the description of an investigation of the mechanism of dispersive additives. The major portion of the investigation was performed with multipurpose additives of the type of the dialkyldithiophosphates (DADTP) of metals and, especially, of DADTP of Ni, which, as some of the authors have shown previously, exhibit strong detergent qualities. The use of additives consisting of a single compound eliminated the effect of unknown components which ordinarily exist in technical additives. Additives of the type of DADTP of Ni were

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ACCESSION NR: AT3001987

selected also, because their hydrocarbon solutions have a specific (violet) hue, a fact that was utilized for the quantitative colorimetric determination of the concentration of the additive in adsorptional tests. The paper reports an investigation of the surface activity of Ni-DADTP. It is concluded that the Ni-DADTP is a surface-active substance and can be adsorbed from a hydrocarbon medium onto the interface between a hydrocarbon medium and water; it can also be adsorbed on the surface of hydrocarbon particles and soot. Such adsorption prevents the "sticking" (aggregation, flocculation) of soot particles and produces the dispersion (peptization) of enlarged soot particles already formed. In effect, the adsorption causes the soot particles to be covered with a layer of Ni-DADTP molecules. Thereupon the affinity of the particles to oil is sharply improved, and the suspension as a whole remains stabilized. Photographs were taken of soot preparations obtained from soot suspensions in toluene with and without any DADTP additive. An EM-100 electron microscope with 15,700x magnifying power was used. The electron-microscope photographs permitted the determination of the mean magnitude of the soot particles and the mean number of molecules adsorbed on an averaged soot particle. The number of particles in percent of the total was plotted versus the particle diameter. In summary, it is concluded that the global action of additives consists in the increased dispersivity of the oily suspension formed during the operation of the engine and the stabilization of that suspension. In other words, a process of the adsorptional dispersion of the insoluble products in the oil is observed. Inasmuch as, during the

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